ATTACHMENT C

Draft Watershed/Fisheries Material
Sweeney Timber Sale EA

Modified by G.Frank 3/5/03

AFFECTED ENVIRONMENT

Watersheds

The proposed timber sale is located within a single parcel of state owned land that is located on the western flank of the Bitterroot valley just south of Florence, Montana. The parcel is drained by an unnamed face drainage, Child's Creek, and an ephemeral draw within the Sweeney Creek watershed. Roads accessing the proposed harvest areas are located in these same watersheds. A short description of each watershed within the affected environment follows. More detailed stream inventories and channel descriptions are available in the hydrology project file.

Face Drainage
Approximately 303 acres of Section 16 are drained by several small, unnamed and discontinuous streams and ephemeral draws which dissect the lower mountain slopes and foothills on the west side of the Bitterroot Valley. Isolated segments of these drainage features contain spring fed perennial and/or intermittent stream channels. However, all surface discharge is intercepted by a series of irrigation ditches either located on the State section or immediately downstream on adjacent private land.

Sweeney Creek
Approximately 105 acres in the Southwest ¼ of the State section is located in the Sweeney Creek watershed. Sweeney Creek is a large third order perennial stream that drains a watershed area of approximately 16 square miles. Most of the watershed area consists of rugged, high elevation, mountainous terrain that is located within the Selway-Bitterroot Wilderness Area. The proposed harvest area is actually drained by an ephemeral draw that contains a short limited segment of intermittent stream channel in its upper reaches. All stream segments within this draw are discontinuous. There is neither a discernable stream channel nor evidence of concentrated surface runoff in the lower reaches where the draw leaves the State section.

Child's Creek
Approximately 209 acres in the north 1/2 of the State parcel are drained by Child's Creek and an unnamed intermittent / ephemeral tributary to Child's Creek. Child's Creek is a second order intermittent tributary to One Horse Creek. The confluence of the two streams is located at the Highway 93 crossing of One Horse Creek. Child's Creek drains a watershed area of approximately 584 acres. The mainstem stream channel is perennial on the State section. However, flows from this channel are largely if not entirely diverted into several irrigation ditches located on the State section and downstream on adjacent private land. Direct surface delivery to Lost Horse Creek is probably limited to peak runoff during spring snowmelt

Other Water Resources

There are two irrigation ditches, the Schreckendgust Ditch and the Lunceford-Schrechendgust Ditch, which flow across the Northeast ¼ of the State parcel. Both of these ditches carry water that is diverted from One Horse Creek approximately ¾ miles north of the State parcel. A portion of the flow from the Schreckendgust Ditch is diverted at into a lateral ditch at a headgate, which is also located in the Northeast ¼ of the State parcel. The lateral ditch traverses the eastern edge of the State section and exits it at the Southeast corner. All of these ditches are used to flood irrigate pastures located immediately adjacent to the State ownership.

A small portion of the State parcel is located in the One Horse Creek watershed. However, no activities are planned for this part of the parcel, so it was not included as a watershed analysis area.

Regulatory Framework

The Bitterroot River drainage, including the Sweeney Creek, Child's Creek and the unnamed face drainage are classified B-1 in the Montana Surface Water Quality Standards. The B-1 classification is for multiple use waters suitable for domestic use after conventional treatment, growth and propagation of cold water fisheries, associated aquatic life and wildlife, and agricultural and industrial uses. Among other criteria for B-1 waters, no increases are allowed above naturally occurring concentration of sediment, which will harm or prove detrimental to fish or wildlife. Naturally occurring includes conditions or materials present from runoff on developed land where all reasonable land, soil and water conservation practices have been applied. Reasonable practices include methods, measures or practices that protect present and reasonably anticipated beneficial uses. The State has adopted Forestry Best Management Practices through its Nonpoint Source Management Plan as the principle means of controlling nonpoint source pollution from silvicultural activities.

None of streams located within the project area have been identified as water quality limited water bodies on Montana's 1996 or 2002 303(d) list.

The Montana Streamside Management Zone (SMZ) Law (MCA 77-5-302) and rules regulate forest practices that occur adjacent to streams, lakes and other bodies of water. The law prohibits or restricts timber harvest and associated activities within a width of SMZ that varies from 50-100 feet of either side of a stream, depending on the steepness of slopes and the class of stream.

The Montana Stream Protection Act (MCA 87-5-501) regulates activities conducted by government agencies that may affect the bed or banks of any stream in Montana. The law provides a mechanism to require implementation of BMPs in association with stream bank and channel modifications carried out by governmental entities. Agencies are required to notify the Department of Fish, Wildlife and Parks (DFWP) of any construction projects that might damage or modify the natural existing shape and form of any stream.

Cold Water Fisheries

Fisheries surveys were completed in Sweeney Creek in 1995 by the Bitterroot National Forest. Both day-time and night-time snorkeling observations were made on a 1000 meter reach of Sweeney Creek starting at the Forest Boundary in 20 T10N R20W. These surveys found both bull trout and westslope cutthroat trout present. A few brook trout were also noted during these surveys. This westslope cutthroat population is considered to have a high potential for genetic purity.

Fish population surveys have not been completed for Child's Creek. However, westslope cutthroat trout were observed in Child's Creek by a DNRC hydrologist while completing stream surveys within the project area.

Bull trout are currently listed as a threatened species under the Federal Endanger Species Act (ESA). As of date, the U.S. Fish and Wildlife Service has not finalized the draft bull trout recovery plan. However, the Montana Bull Trout Restoration Team has developed guidelines that are contained in the State's Bull Trout Restoration Plan. Additional guidance is contained in the DNRC forest management administrative rules and the State Forest Land Management Plan.

Westslope cutthroat trout are recognized as a Class A species by the State of Montana. Class A species are defined as having limited numbers and/or limited habitats both in Montana and elsewhere in North America; elimination from Montana would be a significant loss to the gene pool of the species or subspecies. DNRC has entered into a statewide conservation agreement for westslope cutthroat trout. A Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana was finalized by MDFWP and signed by DNRC and other cooperators in May of 1999. This agreement was a collaborative effort developed by the Westslope Cutthroat Steering Committee that is represented by numerous state and federal resource agencies, conservation and industry organizations, sportsmen and private landowners. Under the MOU, DNRC has agreed to protect all genetically pure and slightly introgressed (less than 10% inrtogressed) WCT populations. Protection includes maintaining or developing high quality habitat to prevent extirpation.

Cumulative Watershed Effects - Existing Conditions

Agriculture, irrigation diversions, flood irrigation return flows, grazing, subdivision, off-road vehicle use, road construction and use, timber harvests and fire suppression have all occurred within the affected watersheds over the past 100 years. A course filter approach was used to screen the affected watersheds to determine existing conditions and to evaluate the potential for cumulative watershed impacts due to increases in water yield and sediment yield. Recent aerial photography was utilized to estimate the percentage of drainage area forested and the extent of the existing

timber harvest with in each watershed analysis area. The analysis also included field evaluations conducted to: 1) Determine existing stream channel condition, 2) determine existing road conditions, 3) identify potential source of sediment, and 4) verify harvest information obtained from air photos. The results of that analysis are summarized in the following table:

Table 1. - Coarse Filter for Potential Cumulative Watershed Effects

Watershed	Watershed Size	Flow Regime	Cold-Water Fisheries	Level of Existing Harvest	Level of Existing Roads
Sweeney	16 square miles	Perennial	Yes BT and WCT	Light Mostly Wilderness	Low
Child's Creek	584 acres	Perennial Largely diverted	Yes WCT	Moderate	Low
Unnamed Face Drainage	1164 acres	Intermittent Discontinuous	None	Light	Low

The results of the coarse filter analysis indicate low risk for of detrimental increases in water yield, and magnitude and duration of peak flows due existing timber harvest and road construction activities in Sweeney Creek, Child's Creek and the Unnamed Face drainage.

A majority of the Sweeney Creek watershed lies within the Selway-Bitterroot Wilderness Area. This portion of the watershed is undeveloped with no roads or recent timber harvest. The remainder of the watershed is largely non-forested agricultural and subdivided housing land use. A Forest-wide Sensitivity Analysis completed by the Bitterroot National Forest concluded that Sweeney Creek watershed was in relatively good condition due to low road densities, small percentage of timber harvest and few other impacts. The watershed was determined to be thresholds for cumulative watershed effects (USFS, 1993).

Both Child's Creek and the unnamed face drainage's are located in watersheds that receive relatively low amounts of precipitation and subsequently produce relatively low amounts of runoff per unit land area. Forested areas in these two watersheds primarily consist of relatively dry Douglas-fir and ponderosa pine cover types. These cover types were subject to frequent low intensity wildfire events prior to settlement and development. Decades of fire suppression have resulted in higher stand stocking levels (density of trees), higher overall basal area and an increase in the total amount of forested area due to range encroachment. Detailed stream surveys were conducted on all stream channels and ephemeral draws draining the proposed sale area. These field inventories of stream channel conditions determined that there was no evidence of channel instability due to increases in the magnitude or duration of peak flows.
All of the watersheds within the affected environment are low risk for cumulative watershed impacts due to water yield increases. Risks of cumulative impacts to water quality and downstream beneficial uses

are limited to those impacts associated with localized sources of sediment delivery within the project area and downstream on private land. Channel instability due to extensive livestock grazing on private land downstream of the State is evident. Detailed sediment source inventories were completed for State's ownership in these watersheds. The results of these surveys are discussed in the section addressing water quality.

Water Quality

Existing impacts to water quality within the project area are primarily associated with accelerated sediment delivery to streams and ephemeral drainage features. Detailed sediment sources surveys were completed for the State's ownership by a DNRC hydrologist and soil scientist. The purpose of these surveys was to identify and inventory all existing and potential sources of erosion and sediment delivery to streams on the State ownership.

Access to the proposed harvest area is provided by an existing County, State and Forest Service road system located on both private and state land. All existing roads on the State's ownership as well as those proposed for access and timber hauling were inventoried during the sediment source survey. Many of these existing roads are in poor condition and do not fully comply with Best Management Practices (BMPs). These roads are substandard due to their location, sustained steep grades, lack of adequate surface drainage features and lack of general road maintenance. Direct delivery of sediment is occurring at several locations on existing roads located within the State section. One segment of lower standard road located in the northwest ¼ of the section contains several unimproved stream crossing. Water has been diverted down the road surface at several of these crossings, which has resulted in moderately severe road surface erosion, small gully erosion and subsequent sediment delivery to several forks of the unnamed face drainage.

Downstream of the State ownership Child's Creek is severely impacted by current grazing management, diversions and private access roads. For the most part the stream channel is stable on state land. One short reach (approximately 100 feet in length) located immediately upstream of the east property line has unstable stream banks due to concentrated livestock use and trampling. In the past, the water leaking from the irrigation ditch which traverses the eastern border of the State parcel has cause several small mass failures and gully erosion with direct sediment delivery to Child's Creek.

The existing roads, and the unstable reaches of irrigation ditch will continue as a chronic source of sediment delivery and pose potential risk to downstream water quality unless improvements, mitigation and remedial action measures are implemented. Site-specific improvements and mitigation measures designed to address existing risk to water quality are discussed in Chapter 4 (the section on effects of the proposed action alternative).

Chapter 4 – Watershed and Fisheries Effects

This section addressed the anticipated effects of the proposed activities on water and fisheries resources within the affected watersheds. The primary concerns related to these resources are potential impacts to water quality and aquatic habitat and the effects of these impacts on downstream populations of Bull trout and westslope cutthroat trout and other beneficial uses such as domestic, irrigation and livestock water uses. In order to address these issues the potential direct, indirect and cumulative effects of the proposed action alternative on sediment delivery and water yield were analyzed.

The following table summarizes the road and harvest activities proposed for each watershed analysis area:

Table 2. Summary of Proposed Activities by Watershed Analysis Area

Watershed	Proposed Harvest (Acres)	Road Relocate (miles)	Existing Road Abandon (miles)	Existing Road Improved (miles)
Sweeney Creek	98	0	1.22	0.42
Child's Creek	40	0	0	0.15
Unnamed Face	172	0.35	0.64	1.5

Water Quality

The primary risks to water quality that are associated with the proposed timber sale are roads, especially roads located along or crossing streams. Risk of erosion and sediment delivery are highest when roads are located in areas with inadequate buffering between streams and other drainage features, on erosive soils, or on steep and/or unstable slopes. A lack of periodic maintenance and adequate surface drainage features, and use during wet periods or conditions may also contribute to higher risk.

All existing roads and proposed road locations within and accessing the timber sale area have been reviewed and inventoried by a DNRC hydrologist and soil scientist. The existing roads and proposed road locations were evaluated to determine both existing and potential risk of erosion and sources of sediment delivery to streams. Many of the existing roads within the proposed sale area do not fully comply with minimum BMPs. Several segments of existing road are eroding and were determined to be contributing direct sediment delivery to streams or at risk of contributing to direct delivery.

Under the proposed action alternative, approximately 2.6 miles of existing road will be improved to a standard that fully complies with BMPs. Another 1.8 miles of existing road would be permanently closed and abandoned under the proposed action. Many of these roads are no longer needed or are the result of unauthorized ATV use. Many of the segments of road to be abandoned are eroding or pose high erosion risk. Also under the proposed action alternative, 0.35 miles of existing road will be relocated to a location that also poses a lower risk to water quality and is more suitable for timber sale activities.

Some short-term increases in sediment delivery to the unnamed face drainage may occur during and/or shortly after the installation of several new culverts intended to replace unimproved stream crossings. Application of BMPs, site specific design and mitigation measures are expected to reduce erosion and potential sediment delivery to an acceptable level as defined under the Montana Water Quality Standards. Acceptable levels are defined as those conditions occurring where all reasonable land, soil, and water conservation practices have been applied.

Presently, water is intercepted at several unimproved stream crossings and diverted down the existing road surface. Considerable amount of road surface erosion and sediment delivery to the stream is occurring. The proposed road relocation and culvert installations are designed to address these problems and reduce long-term erosion and sediment delivery concerns. These road segments will continue to be a chronic source of sediment delivery to the unnamed stream unless the relocation and crossing improvements are implemented.

The proposed road improvements, road abandonment and road relocation activities are expected to result in reduced erosion and sediment delivery to streams and ephemeral drainage features within the proposed projected area. The anticipated impact of these activities would be improved water quality, improved protection of cold water fisheries and other downstream beneficial uses when compared to the current existing conditions.

All proposed harvest stands have also been reviewed and evaluated in the field by a DNRC hydrologist and soil scientist. Selection of appropriate operating seasons, limiting equipment operations to suitable slopes or designated trails and appropriate ground conditions, and implementation of appropriate BMPs and mitigation measures will be used to reduce the risk and severity of soil erosion and potential sediment delivery to streams and ephemeral drainage features. In addition, streamside management zones and equipment restriction zones will be designed to effectively buffer streams and other ephemeral drainage features from harvest activities.

There is no means of direct sediment delivery from the proposed harvest area to Sweeney Creek. The portion of the state parcel located in the Sweeney Creek watershed is drained by an ephemeral draw that does not contain a discernable stream channel in the lower segments. The draw bottom is well vegetated with brush, grasses and forb species. Any concentrated ephemeral discharge flowing continuously down the draw is intercepted by one of several irrigation ditches that bisect the draw

bottom down slope of the state ownership. Equipment restriction zones will be utilized to limit erosion risk within all ephemeral draw bottoms.

No impacts to water quality, cold-water fisheries or other downstream beneficial uses are expected to result from the proposed harvest activities.

Cumulative Watershed Effects

Cumulative watershed effects are off-site, downstream changes in hydrology, sediment production, transport and storage in response to a combination of multiple land management activities. A coarse filter approach was used to determine the potential hydrologic effects of the proposed actions when combined with past or other ongoing activities.

The risk of detrimental levels of water yield increase (increased magnitude or duration of peak flows) due to timber harvest is low for all potentially affected watershed under the proposed action alternative. This conclusion is based on the natural and existing levels of forest canopy cover, low annual basin precipitation in the Unnamed face drainage and Child's Creek, and the partial canopy removal prescriptions included in the proposed action.

As noted in the Existing condition section, a majority of the Sweeney Creek watershed lies within the Selway-Bitterroot Wilderness Area. This area is undeveloped with no timber harvest or road building activities. Forest canopy cover is likely to be much higher than would have been expected during pre-European settlement due to wilderness wildfire supression and forest range encroachment at lower elevation foot slopes and edge of Bitterroot Valley bottom.

Both the Child Creek and Unnamed Face drain areas that are relatively low elevation with only 20-25 inches of annual precipitation and consequently relatively low levels of runoff. These watersheds have only had light to moderate levels of harvest activity over the last several decades. Therefore, overall forest stocking levels and canopy cover are still higher over much of the drainage area due to fire suppression and range encroachment than would be expected pre-settlement conditions. The proposed prescription would remove approximately 40-45 % of the basal area from those stands treated. The amount of residual forest canopy remaining following harvest would have a compensating effect, which limits the potential for additional offsite water delivery. The remaining forest stands will likely utilize most of the soil moisture available onsite during the growing season and still provide a large degree of canopy area for interception of rainfall and snowfall.

No increases in sediment yield are expected to result from implementation of the proposed action alternative. The activities proposed under the action alternative would reduce the total amount of road on the State parcel to 2.6 miles. Approximately 1.8 miles of existing road would be permanently closed and abandoned. Another .35 miles of road would be relocated out of the SMZ. The remaining 2.6 mile of existing road will be improved to meet minimum BMPs and to reduce erosion and sedimentation

risk. Implementation of the proposed action is expected to reduce long-term sediment yields and erosion risk from waters draining the State parcel.

Cold Water Fisheries

Only minor amount of timber harvests is proposed within Streamside Management Zones of fish bearing streams. The SMZ harvest would be limited to 7 acres of selective harvest (thinning) of a stand located adjacent to Childs Creek. The light harvest would only occur in the outermost portion of the SMZ. No tree would be harvest immediately adjacent (within 25') to the stream. Therefore no substantial reduction in the levels of potential large woody debris recruitment, stream shading and no increases in stream water temperatures are expected under the proposed action. SMZ widths will comply with the Montana Streamside Management Zone Law and the State Forest Land Management Plan.

The proposed road improvements, road abandonment and road relocation activities are expected to result in reduced erosion and sediment delivery to streams and ephemeral drainage features within the proposed projected area (see Water Quality section). The anticipated impact of these activities would be improved water quality and improved protection of cold water fisheries habitat in Child's Creek.

Populations of Bull Trout with in the Sweeney Creek drainage will not be affected by the proposed action. That portion of the State ownership lying within the Sweeney Creek watershed is actually drained by a discontinuous ephemeral draw. The draw contains isolated segments of intermittent stream channel. However, these segments are not fish bearing and discontinuous. There is no direct delivery of concentrated surface runoff from the proposed project area to Sweeney Creek.

References

MDEQ, 1996. Year 1996 Montana 303(d) List, Montana Department of Environmental Quality, Helena, MT.

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USFS, 1993. Bitterroot National Forest Watershed Evaluation Process, Bitterroot National Forest, Hamilton, MT.